

REMARKS

Claims 10,15 and 23-29 have been canceled herein without prejudice or disclaimer. Claims 1-5, 11-13 and 16-18 have been amended herein. Claims 1-9, 11-14 and 16-22 remain pending herein.

1. Examiner Stein is thanked for courtesies extended during a telephonic interview on March 15, 2005 with Applicants' undersigned attorney. The substance of the telephonic interview is incorporated into the following remarks.

2. Claims 1-7, 9-14 and 17-22 were rejected under §102(b) over Cullen, et al. In addition, claims 1, 15 and 16 were rejected under §102(b) over Wang. These rejections are respectfully traversed for the following reasons.

In short, as discussed during the telephonic interview, each of the cited references fails to disclose (or suggest) a non-stoichiometric spinel having a b:a ratio greater than 2.5. In fact, not only do the references not disclose such a high ratio, but specifically teach against a b:a ratio greater than 2.5. Particularly, in reference to Wang, column 4, lines 55-58, Wang expressly teaches that if the aluminum oxide to magnesium oxide ratio is greater than 2.5, exsolution and cracking of the substrate tend to occur. In a somewhat similar manner, Cullen, et al. describe in column 5, lines 44-56 that above a b:a ratio of 2.3 other process problems arise. Accordingly, it is quite clear that cited prior art teaches precisely the opposite of the claimed invention.

While the amendments to the claims in light of the express teaching of the cited prior art should be sufficient to overcome the 102 rejections, Applicants further comment on the significance of the claimed b:a ratio greater than 2.5. Particularly, in reference to the present specification, particularly the example described on pages 12 and 13, Applicants describe the growth of a non-stoichiometric spinel having a b:a ratio of about 2.9. As specified, a high b:a ratio boule is successfully formed fairly rapidly, particularly with respect to the cool-down time of 6 hours, which translates into a cooling rate of about 180°C per hour. In addition, no annealing steps need be carried after cooling (prior to wafer fabrication from the boule). The foregoing process flow, incorporating a quick cool-down and elimination of annealing, is particularly beneficial, enabling reduction of the thermal budget of the entire fabrication process, and attendant cost reduction. See the paragraph bridging pages 9 and 10 of the present specification. In addition, the relatively high b:a ratio as claimed enables formation of intact boules and high yield rate wafer processing. While somewhat unclear as to the technical reasons why the cited prior art is unable to properly form boules and wafers from high-ratio melts, it is believed that the high oxygen, high hydrogen environments utilized by the prior art may be responsible for negative impact on the surface tension of the growing boule, negatively impacting the growth kinetics of the boule.

For at least the foregoing reasons in view of the amendments herein, Applicants respectfully submit that the claimed invention is novel (and non-obvious) over Cullen, et al. and Wang. Accordingly, reconsideration and withdrawal of the §102 rejections are respectfully requested.

3. Claim 8 was rejected under §103(a) over Cullen, et al. Applicants submit that this rejection is deficient for the reasons advanced above, and should also be withdrawn.

Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, Examiner Stein is requested to issue a Notice of Allowance for all pending claims.

Should Examiner Stein deem that any further action by the Applicants would be desirable for placing this application in even better condition for issue, he is requested to telephone Applicants' undersigned attorney at the number listed below.

Applicant(s) does not believe that any additional fees are due, but if the Commissioner believes additional fees are due, the Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-2469.

Respectfully submitted,

Date

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Jeffrey S. Abel, Reg. No. 36,079

Attorney for Applicant(s)

TOLER, LARSON & ABEL, L.L.P.

5000 Plaza On The Lake, Suite 265

Austin, Texas 78746

(512) 327-5515 (phone) (512) 327-5452 (fax)